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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/565,433

01/20/2006

Gaetano Guerra

GRT/4161-15

2159

23117

7590

12/04/2009

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EXAMINER

NEGRELLI, KARA B

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

12/04/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/565,433

Applicant(s)

GUERRA ET AL.

Examiner

KARA NEGRELLI

Art Unit

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 4-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI/200)
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date: _____

NANOPOROUS AND MICROPOROUS MANUFACTS BASED ON SYNDIOTACTIC

POLYSTYRENE AND PROCESSES FOR THEIR PREPARATION

DETAILED ACTION

Response to Amendment

1. Newly submitted claims 18-20 ARE directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

Claim 18 is grouped with Group II, claims 8-15, drawn to a process of making a microporous polymeric material.

Claim 19 is grouped with Group III, claim 16, drawn to a process of using a microporous polymeric material.

Claim 20 is grouped with Group IV, claim 17, drawn to a device for detecting organic volatile compounds.

2. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 18-20 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.
3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Any rejections stated in the previous Office Action and not repeated below are withdrawn.
5. Any new grounds of rejection set forth below are necessitated by applicant's amendment filed on September 21, 2009. In particular, claim 3 has been amended to recite limitations from claim 1 and to further limit the amount of polymer concentration in

the gel to be from 0.5-30 wt%. Claims 4-7 and 11-14 have been cancelled. Claims 8-10 and 15-17 are withdrawn from consideration as being drawn to non-elected inventions.

6. No new rejections have been made over previously rejected claims. It is further noted that the newly introduced limitations of claim 3 were not present at the time of the preceding action. For this reason it is proper to make the present action FINAL.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Guerra et al. (IT 1306004). Please refer to the English translation which is included in this action.

9. Guerra et al. teach a process for obtaining nanoporous semicrystalline materials from syndiotactic polystyrene in which the definition of syndiotactic polystyrene includes styrene copolymers with a prevalently syndiotactic microstructure that can be crystallized into the nanoporous crystalline form with $\text{CH}_2=\text{CH-R}$ olefins, wherein R is an alkyl-aryl or a substituted-aryl radical with 6-20 carbon atoms or with other copolymerizable ethylenically unsaturated monomers (See translation, page 2, lines 1-11). The syndiotactic polystyrene, in the form of a powder, contains 15% by weight of styrene, and this powder is refluxed with toluene (a solvent) for 2 hours (See Example 2, page 6 of the translation). Guerra et al. further teach extraction with carbon dioxide,

either liquid or under supercritical conditions, and preferably the extraction conditions are such that $30^{\circ}\text{C} < T < 70^{\circ}\text{C}$ and $70 \text{ bar} < P < 150 \text{ bar}$ (See translation, page 4, line 21- page 5, line 2 and Examples 1 and 2, pages 5 and 6, respectively). Particular examples are removal of the solvent using carbon dioxide under supercritical conditions at a temperature of 40°C and a pressure of 200 bar (See Examples 1 and 2, pages 5 and 6 of the translation, respectively).

10. One of ordinary skill would recognize that dissolving a powder in the amount of solvent disclosed by Guerra et al. (IT 1,306,004) would result in the formation of a gel. The specification of the instant invention teaches dissolving a syndiotactic polymer in 10 wt. % of solvent, which forms a physical gel (paragraph [0042]). Therefore, the material disclosed in Guerra et al. (IT 1,306,004) anticipates instant claim 1.

11. Guerra et al. (IT 1,306,004) do not expressly teach that the nanoporous material has an apparent density of $0.001 - 0.8 \text{ g/cm}^3$ and a percentage of crystallinity between 5-70%. However, since the nanoporous polymeric material taught in Guerra et al. (IT 1,306,004) discloses identical materials which may be used in the same amounts as are taught in the instant application. Therefore, one of ordinary skill in the art would expect that the nanoporous polymeric material taught in IT 1,306,004 would have the same properties disclosed in instant claim 1. Case law holds that a material and its properties are inseparable. *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

12. Guerra et al. (IT 1,306,004) does not expressly teach that the composition formed does not contain chemical crosslinking. However, since no crosslinking agent or

curing step is used or described, one of ordinary skill in the art would recognize that the composition would not contain chemical crosslinking.

Response to Arguments

13. Applicant's arguments filed October 31, 2009 have been fully considered but they are not persuasive.

14. Applicant argues that there is no reason to believe that the polymeric material produced in the invention of Guerra et al. IT 136004 (referred to as '004 from hereon out) is not the same and would not have the same properties as the instantly claimed invention, citing to literature which reports that in s-PS samples the clathrate samples clearly report that the guest content is generally lower than 20 wt%, and that in Example 2 of '004, toluene was present in an amount of 15 wt%.

15. Applicant asserts that one of ordinary skill in the art would have recognized that absorbing this amount of solvent in a polymeric material would usually result in a plasticized polymer. Applicant further asserts that in the process taught in the '004 patent, physical gels would not form. Applicant adds that present claim 1 requires that polymer concentration in the intermediate gel (i.e. prior to solvent removal) is between 0.1 and 50 wt%, which corresponds to a solvent concentration in a range between 50 and 99 wt% at most. Applicant states that therefore, 14 wt% toluene in the '004 patent does **not** necessarily teach a solvent concentration in the latter range. Applicant further asserts that the instant invention teaches dissolving the syndiotactic polystyrene

material in a 10 wt% solution and thus, 90 wt% of the solution is solvent because the rest of the solution is solvent.

16. Applicants' argument is not persuasive. The solvent range of 50 to 99.9 wt% is neither claimed nor disclosed in the instant application. Furthermore, Example 1 of the instant application teaches that a syndiotactic polystyrene homopolymer was dissolved in 10 wt% chloroform (solvent). In addition, instant claim 1 teaches that the polymer concentration is from 0.1 and 50 wt%, and instant claim 3 further limits the polymer concentration to 0.5 to 30 wt%, which are in a solvent or mixture of solvents, one of which is a suitable guest of a syndiotactic polystyrene clathrate phase. Paragraph [0029] of the instant specification teaches that suitable solvents include toluene, styrene, or chloroform.

17. The '004 patent teaches such a concentration of styrene monomer on page 5, Example 1 (15 wt% styrene) which is polymerized to form syndiotactic polystyrene. The '004 patent further teaches, on page 6, Example 2, that the syndiotactic polystyrene formed in Example 1 is refluxed with toluene for 2 hours, and after this time period, 15 wt% toluene (solvent) remains in the lattice. The solvent is removed by supercritical carbon dioxide at a pressure of from 70-150 bar and at a temperature of 30°C to 70°C (see page 4-page 5 of '004). An example is extraction with carbon dioxide at 40°C and 200 bar (see examples 1 and 2).

18. Applicant further argues that the '004 patent discloses the production of polymeric materials which always have an apparent density of greater than 1 g/cm³. Applicants' argument is not persuasive. No where in the disclosure or claims of the '004

patent do the inventors teach that the polymeric materials "always have an apparent density of 1 g/cm³."

19. Applicant argues that the lack of an express statement that the '004 patent teaches a composition that does not contain chemical crosslinks is not sufficient basis for disclosing this negative limitation. Application points to MPEP 2173.05 (i), which the applicant points to the statement that "The mere absence of a positive recitation is not basis for an exclusion."

20. Applicants' argument is not persuasive. While the MPEP 2173.05 (i) does state that "The mere absence of a positive recitation is not basis for an exclusion," MPEP 2173.05 (i) is not in regards to prior art, but rather teaches that in an *instant application* the mere absence of a positive recitation is not basis for an exclusion, meaning that in the claims of an application, an applicant may not exclude components merely because they are not mentioned in the specification of the instant application.

21. MPEP 2173.05 (i) states: Any negative limitation or exclusionary proviso must have basis in the original disclosure. If alternative elements are positively recited in the specification, they may be explicitly excluded in the claims. See *In re Johnson*, 558 F.2d 1008, 1019, 194 USPQ 187, 196 (CCPA 1977) ("[the] specification, having described the whole, necessarily described the part remaining."). See also *Ex parte Grasselli*, 231 USPQ 393 (Bd. App. 1983), *aff'd mem.*, 738 F.2d 453 (Fed. Cir. 1984). The mere absence of a positive recitation is not basis for an exclusion. Any claim containing a negative limitation which does not have basis in the original disclosure should be rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written

description requirement. Note that a lack of literal basis in the specification for a negative limitation may not be sufficient to establish a prima facie case for lack of descriptive support. Ex parte Parks, 30 USPQ2d 1234, 1236 (Bd. Pat. App. & Inter. 1993). See MPEP § 2163 - § 2163.07(b) for a discussion of the written description requirement of 35 U.S.C. 112, first paragraph.

22. The '004 patent does not teach a crosslinking agent, UV curing, heat curing in an oven, or any other step which would imply that the polymeric substance has been crosslinked. Therefore, one of ordinary skill in the art would reasonably expect that the formed polymer contains no chemical crosslinks.

23. Paragraph [0042], Example 1 of the instant specification reads: "...The polymer was dissolved in chloroform (10 wt% solution) in 110°C in a hermetic test tube." It is noted that this statement can be interpreted as meaning either (1) there is 10 wt% polymer or (2) there is 10 wt% chloroform. The prior art, which the applicant states that the examiner has misinterpreted, contains a very similar description. In example 2 of the '004 patent, syndiotactic polystyrene powder is treated at reflux with toluene for 2 hours, after which 15% of toluene remains in the formed lattice. As interpreted by the examiner, the disclosure of the '004 patent is sufficient to anticipate the instant claims as they are currently written.

Conclusion

24. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

25. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KARA NEGRELLI whose telephone number is (571)270-7338. The examiner can normally be reached on Monday through Friday 9:30 am EST to 6:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571)272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KARA NEGRELLI/
Examiner, Art Unit 1796

/Randy Gulakowski/
Supervisory Patent Examiner, Art Unit 1796